








# Innovativeness of Micro and Small Enterprises – Are Their Innovation Drivers Different?

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**Abstract.** In the second half of the 20th century the labor cost, along with the level of industrialization, was considered to be the fundamental competitiveness factor. In today's competitive business environment, innovation is the vital ability and activity for firm's sustainability. Although the innovation is widely examined in the literature, further research is needed in this field to address the factors which determine the innovativeness of micro and small enterprises. The purpose of this research was to fill in that gap through development and implementation of a methodology for modelling of the innovativeness of micro and small enterprises. The first step is the analysis of the relevant literature and mapping two types of factors that are widely discussed: influencing factors – supporting innovation and influenced factors. The conceptual model that was developed based on these findings is refined through structured interviews of 18 experts from different stakeholders in the innovation ecosystem, and from different regions. The refined model was validated through 150 quantitative interviews with micro and small companies in the Northeast region of North Macedonia. The following factors were validated as most influential in the analyzed region: the openness of the company, the identification of the employees with the company, communication, owner's profile, educational diversification of employees and encouraging employees to propose innovation. The methodology and the models offer significant input into future research, in the development of analytical tools on macro level, as well as for modelling of innovativeness on company level.

**Keywords:** Modelling innovation · Innovation of micro and small enterprises · Factors of innovativeness · Measuring innovativeness · Innovation ecosystem

## 1 Introduction

Innovations are the main enabler of competitiveness and driver of development, particularly in the knowledge based economies. In the last decades, many developing economies

has strongly emphasized them as one of the key actions in their transitional strategy. Innovations are considered to be one of the most progressive determinants of socioeconomic growth, both in regional and local perspective [1]. High levels of innovativeness have a positive influence on performance at the firm level [2] and, as a result, on economic performance at the regional or national levels as well [3].

The innovativeness is a crucial aspect for development and competitiveness of micro and small enterprises (MSE), and through them of the respective economies. This notion, along with the presented lack of literature for its understanding imposes the need to select, define and measure the factors influencing the innovativeness of MSEs. The state model of North Macedonia, as many former socialist countries, resembles to the triple helix. However, the state has a governing role in the collaboration between the three main spheres of the society [4, 5].

The lack of acknowledged systems for measurement of innovation, requires additionally focus on the factors influenced by the innovation activities and results. On the other hand, the impact of the innovation ecosystem on innovativeness of the firm, imposes validation of the model in a specific ecosystem, requiring systematic approach for selection of both influencing and influenced factors.

## 2 Literature Review

The factors for innovation of micro and small enterprise are the essence of this research. To offer a comprehensive overview of the relevant factors, two main categories of influencing factors have been identified and further analyzed: (I) *Entrepreneurial attitude and internal ecosystem*, and (II) *Innovation process*. These two categories are divided into three (A. *Overall setting*; B. *Culture* and C. *Knowledge management*) and two (D. *Collaborations and external support* and E. *Procedures and regulations*) smaller groups of factors, respectively. Influenced factors are presented as category (III) *Innovativeness*, grouped into two groups (F. *Introduced innovation* and G. *Growth*). In this paper, only a selection of the literature review is presented.

### 2.1 Factors Influencing Innovativeness

Numerous general factors significantly influence the innovativeness of the enterprises, such as: the main sector of operation, the geographic market that is targeted, the strategic planning within the company and its corporate success, estimated through the financial results, growth in portfolios and growth in number of employees, as well as the environmental impact. Many studies have shown that the culture of the company is one of the most important factors for innovativeness. It is discussed that openness to change influences the way how early ideas for innovations are screened and approached within the company [6]. Aloulou and Fayolle [7] consider “especially organizational culture, the nature of its climate and its practices of management” (p. 29) as a central antecedent of entrepreneurial orientation. Entrepreneurial orientation in smaller firms (start-ups and SMEs) mostly originates from the owner’s profile. The openness in the companies, proposes that firms should purposively use inflows and outflows of knowledge to accelerate internal innovation, and to expand markets for external use of innovation [8]. External

knowledge sourcing requires internal capabilities in order to (1) integrate inflows of knowledge with internal innovation activities, (2) successfully apply knowledge from internal and external sources, and (3) direct innovation actions [9, 10].

The internal ecosystem and culture, along with the innovation process is developing the company's innovativeness. This process is affected by collaboration with external partners on one hand, and the procedures and regulations for managing of innovations internally, on the other. Developing partnerships for innovation is particularly with larger companies is essential for SMEs competing in global business-to-business (B2B) markets [11]. However, for SMEs such collaborations may encounter various challenges [12, 13], such as identifying suitable customers for collaboration [14], and developing trusting relationships with customers [15].

## 2.2 Factors Influenced by Innovation

Measuring innovation in a company is not unambiguously defined in the literature. Innovation is often associated with the level of improvement of the relevant goods or services, which is arguable since the innovation project does not necessarily result in an increased product competitiveness [16]. The innovativeness shows the company's ability to be receptive to new ideas and their acceptance, which leads to the development and launch of a new product [17, 18]. Subramanian [19] notes that enterprise innovation is perceived differently depending on the research approach.

Introducing different types of innovation improves the survival of companies, confirming the old adage: "innovate or die". In addition, innovative firms need to introduce different types of innovation addressing multiple aspects of the organization [20, 21].

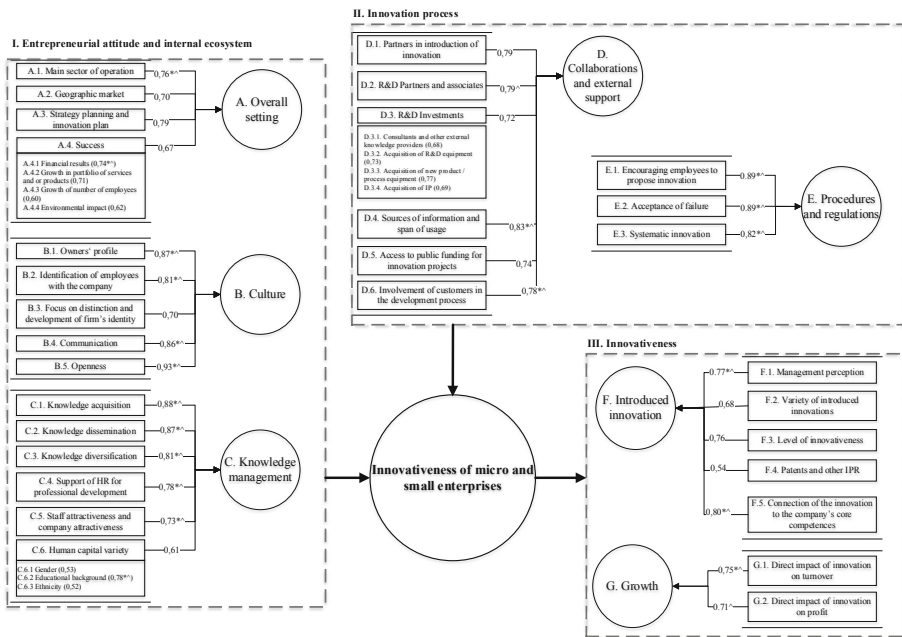
The growth of companies is one of the most frequently analyzed factors influenced by the innovation of the company. Colombelli et al. [22] analyzed level of innovation in the French industry, in the period 1992–2004, suggesting that innovative firms grow more than non-innovative ones. Mansfield [23] analyzed 10 companies and aggregates of 10 different industries in the United States from 1916 to 1954. The main conclusion was that companies which have implemented significant innovations are growing faster. A panel survey of 500 manufacturing companies in Italy (1989–1997), analyzed the operating profit margins, showed connection between growth and intensity of research activities [24]. The same conclusion is reached in the public sector [25]. Almost simultaneously (1998–2004), research in 95 semiconductor companies worldwide, showed that company growth and total sales are positively affected by the number of product innovations [26]. This additionally shows the lack of consensus on the factors influencing the innovativeness, emphasizing the importance of systematic approach in determination of the influential and influenced factors.

The innovations introduced in the company can be evaluated by assessing the perception of the management, the level of innovation, the connection of innovations with the key competencies of the company, as well as through variety of introduced innovations, patents and other forms of intellectual property. The direct impact of innovation on firm growth can be identified by tracking profits and revenue.

### 3 Research Methodology and Model Creation

The research has been designed as a three phase process. Initially, a wide set of relevant factors for innovativeness for micro and small enterprises, are identified throughout the analyzed relevant literature. The developed draft conceptual model was used as a base for development of the draft guidelines for the structured interview with the experts. This guideline was tested through two pilot interviews with relevant academic experts (one from North Macedonia and one foreign) in order to assure that: (1) there is no lack of significant factors or a factor redundancy, and (2) the chosen factors and their respective descriptions are clear, precise and significantly detailed.

Based on the interviews two factors were added to the draft conceptual model and several factors were further defined, resulting with the final **conceptual model** (Fig. 1).



**Fig. 1.** Conceptual model of the factors for innovativeness of micro and small enterprises

The second phase is the development of the **refined model**, evaluating the conceptual model through 18 structured interviews conducted with experts in the period summer - autumn 2016. The experts have been clustered in three professional categories: (1) Academia, (2) Business support organizations (BSO) and (3) Entrepreneurs in two geographic categories: (1) North Macedonia and (2) foreign. All identified experts from academia and BSO fulfil the strict entry criteria: topic – expertise in the area of innovation of micro and small companies; experience – more than 10 years' related experience; and education – second cycle higher education (master) or higher. For the entrepreneurs: the minimum required education first cycle higher education (bachelor),

and it was assured that the company established and managed is clearly recognized as an innovative company. The detailed methodology for the creation of the refined model (Fig. 2) is presented in Jovanovski et al. [27].

In the model **validation phase**, for each factor at least one indicator (statistical variable) is created. In order to cover all main aspects of the factor, some of these variables are receiving values from multiple questions. The factor which could not be validated with quantitative analysis, have been validated though an in-depth interview.

### **Qualitative Factor Validation**

Based its nature the factor *B.1. Owner's profile* is not suitable for quantitative analysis, which was also confirmed by the experts during the interviews. Thus, this factor was validated through three hours' in-depth interview with an entrepreneur. The selected interviewee is an owner of three companies, two connected vertically in the supply chain, and one in a different sector.

Based on the interview it was concluded that the capability of the owner to track business opportunities, combined with the skill for foreseeing future challenges and the determination for creation solution for these challenges is one of the key factors for business success. His strong leadership is influential throughout the company with a main focus on development of creative atmosphere, making all sectors in the firms innovative. Thus, the influence of the owner over the innovativeness is clearly notable through the development of communication, acquisition and dissemination of knowledge and experiences, identification of employees with the company, encouraging employees to propose and implement innovation projects, as well as including external experts.

### **Quantitative Factor Validation**

The quantitative validation was conducted based on primary data (face-to-face survey of 150 micro and small companies), in order to decrease the influence of the external factors (local labor market, infrastructure, etc.), collected in a single micro-region.

In the refined model three most significant factors influenced by innovation have been selected. In order to validate the model using statistical analysis based on multiple regression, statistical model, or a sub-model was created for each of them.

### **Comparison of the Parameters of the Statistical Models**

The three statistical models are significant with  $R^2$  values 0,631, 0,706 and 0,632 respectively, providing models which explain 63,1%–70,6% of the change in the dependent variables. Throughout the models, 6 factors had confirmed significant relation, out of which three have been confirmed in at least two of the models (Table 1). Such harmonization of results may indicate selection of substantial influencing factors and influenced factors which capture the key results of the innovation activities.

The regression model of each of the three dependent variables was significant, thus the three analyzed regression models composed the validated model. Given that the sub-models as a whole were significant, the validated model is composed of all factors of the validation sub-models (statistical models), expanded with the factor validated through a qualitative in-depth interview. Based on that the validated model comprises all the factors included in the refined model. The only difference appears with factor C.6.2.

Education, which due to its complexity, in the validation phase was analyzed as two separate factors: C.6.2.1. Education (Level) and C.6.2.2. Education (Field).

**Table 1.** Overview of the validated factors and their relations with the dependent variables

	Dependent variables ( $R^2$ of the model)		
Factors validated through the model of the respective dependent variable	F.1._Management_perception ( $R^2 = 0,631^{**}$ )	F.5_Inno.core.competences ( $R^2 = 0,706^{**}$ )	G.1._Dir.inf.turnover ( $R^2 = 0,632^{**}$ )
B.2. Identification of employees with the company		✓ <sup>**</sup>	✓ <sup>*</sup>
B.4. Communication			✓ <sup>*</sup>
B.5. Openness	✓ <sup>*</sup>	✓ <sup>**</sup>	✓ <sup>*</sup>
C.2. Knowledge dissemination	✓ <sup>*</sup>		
C.6.2.2 Educational background (Field)	✓ <sup>**</sup>		✓ <sup>**</sup>
E.1. Encouraging employees to propose innovation		✓ <sup>**</sup>	

\*\* Significance  $p < 0,01$

\* Significance  $p < 0,05$

Although, the refined model was validated as a whole, the statistically significant impacts of the factors are reported in the validated model (Fig. 2):

#### *Not-validated Individual Relations*

Influential factors whose coefficients in all regression models are statistically not significant, are presented with a dashed line.

#### *Validated Individual Relations*

Influential factors whose individual relation are validated in at least one sub-model, are indicated by ticker lines and bold text. It is stated which sub-model(s) and at what level of significance were used, or that it is validated through the in-depth interview.

#### *Dependent Variables*

The influenced factors are indicated by a full thin line. The statistical significance is stated of the regression model with which they were validated.

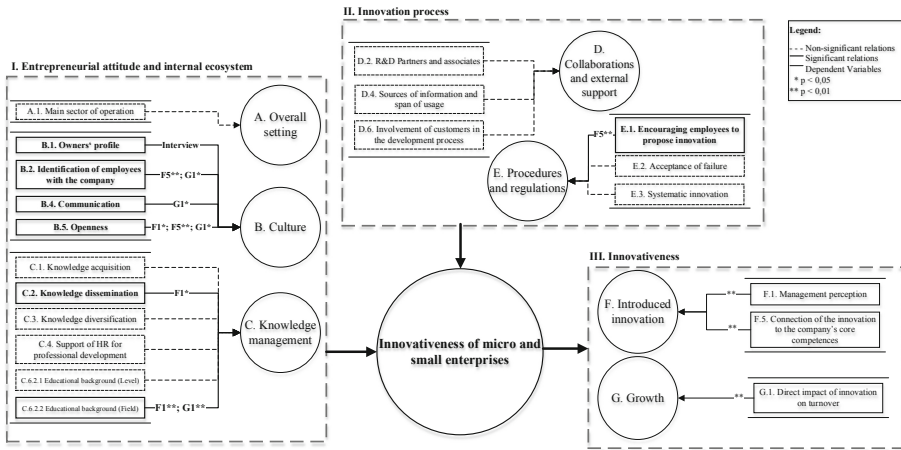


Fig. 2. Validated model of the innovativeness of micro and small enterprises

## 4 Conclusion

The models for innovativeness of micro and small enterprises play an important role in understanding of the innovativeness with particular focus on MSEs. **The conceptual model**, with the literature analyzed and structured for its development, represents an important synthesis of the contemporary global literature of factors for innovativeness, providing a comprehensive overview. **The refined model** presents the most influential factors for MSE innovation, as well as factors and indicators for measuring it (influencing factors). Thus, closing significant research gap in the global literature. The results of the survey of micro and small enterprises, in addition to the **validation of the model**, which has universal significance, contribute to the understanding of the driving forces of innovation in micro and small enterprises in the Northeast region of Republic of Macedonia, and indirectly across the country. As the only research of its kind it is very significant for the country, as well as for countries with similar economic development.

**On factor level**, this research stresses the importance of the culture of the MSE presented through the entrepreneurial, innovative and open-minded spirit of the owner(s), a dynamic team identifying themselves with the firm, which is open to ideas, suggestions and changes, with extensive internal and external communication.

**Policy makers and entrepreneurs** can use the framework for setting up an Innovation Measurement System for MSEs, as important support for identifying weaknesses in innovation systems, as well as for selecting priority targets to increase competitiveness at enterprise and/or specific ecosystems level.

For the **researchers** in the field, this research offers a comprehensive overview of the factors that influence and are influenced by the innovation of micro and small enterprises. Through the models and methodology, platform for additional research of the innovation of the enterprises with other characteristics or in other ecosystems.

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